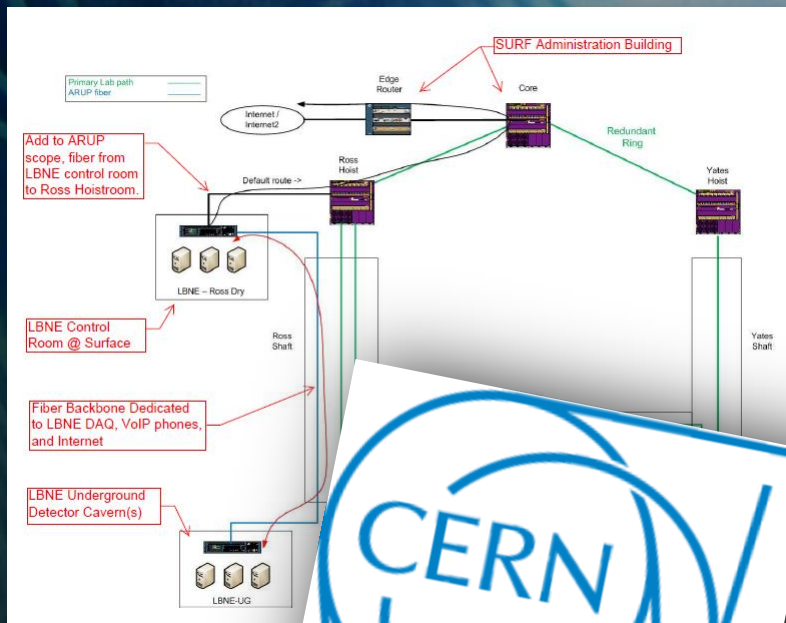
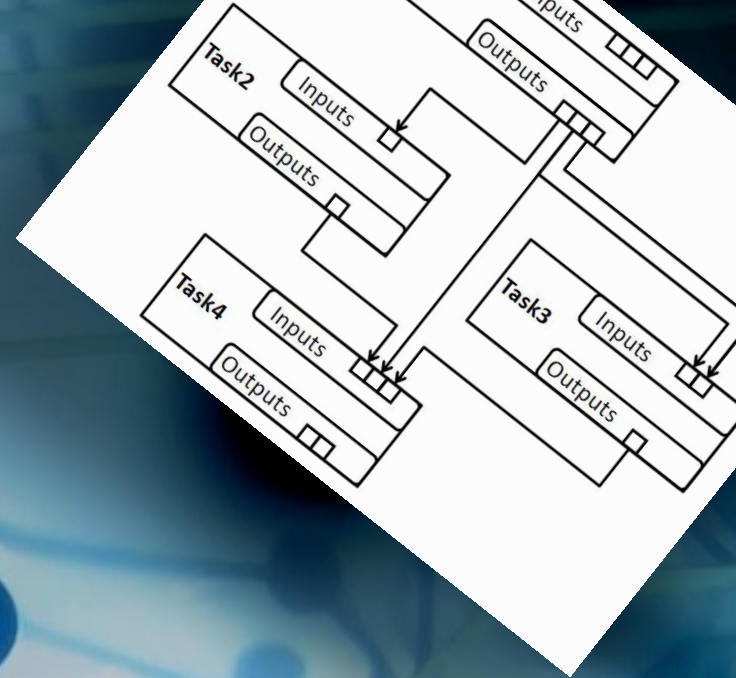


Overview of S&C planning activity in Q2/Q3 2015



Maxim Potekhin

LBNE BNL Meeting
March 4, 2015

CERN

Motivations

We need to develop the following documents in 2015:

- CERN test proposal
- xLBNx CDR...
 - ...which overlaps with:
 - FD site engineering requirements (handled by Sanford)
 - xLBNx Computing Model (TBD): need to start cooperation within xLBNx asap

All of these documents will have a Software and Computing section/chapter or other component, and since our S&C work is driven by physics and physics tools, there will be a continuous need for information exchange and coordination (against the backdrop of a larger international collaboration).

Our funding agencies will be sure to look at this.

CERN proposal

- Draft version of the S&C section was submitted 3 weeks ago (no feedback received yet from T. Kutter except for statement that this paper work in progress) – ETA is not well defined at this point due to slow pace of the new Collaboration formation.
- As you know, projected data volume was actively debated and estimates have been improved.
- Started documentation, see https://lbne.bnl.gov/wiki/CERN_Prototype
- Even after it was revised downwards, the data volume is still considerable (~1PB) and needs proper attention and effort to handle + coordination with CERN
- Items included in the proposal:
 - Data volume estimates
 - Data replication strategy (e.g. 3 copies total + we intend to have a considerable fraction of the data stored at BNL and NERSC in addition to FNAL)
 - Data transmission technology
 - Distributed computing

CERN proposal, cont'd

- WA105/CERN connection is crucial in order to make progress. Considering shared components/formats/storage with WA105.
- On Kutter's advice, contacted Sebastien Murphy (WA105, ETH Zurich), this got forwarded to A.Rubbia on 2/27/2015 and no feedback received yet – will need to follow up.
- Concern is being expressed over portability of LArSoft (Kutter) – again, we need a working communication channel within xLBNx and with WA105x.
- Nothing concrete from our DAQ group since they are very busy with the 35t
- Time is short (just 100 weeks before data taking, each lost week equals 1% of lost effort)

- Looking at previous examples of CDR for "old LBNE", we see that there is a healthy dose of DAQ, data rates and timing discussion
- With the deep placement of the FD there are design choices - where to house DAQ/slow control systems, what are the requirements to the data link to the surface, space (excavation, too), power and cooling etc related to FE/DAQ/storage/networking at the far site (and at depth)
- According to Sanford people, there are considerable cost considerations related to these choices
- ...so all of this needs be understood and documented (Giles & DAQ team are working on some specs)
- **Example:** *requirements for fiber optic links are communicated to the contractors now*
- **In the recent Collaboration phone call** people seemed to agree that S&C needs to be integrated into the CDR (including J.Strait) – probably into the FD section. S&C must be in the plans and effort must be allocated to R&D in this area.
- **Example:** detection of the supernova signal poses additional challenges due to rare but considerable spikes in recorded/buffered data, networking and CPU requirements ($O(10)$ GB/s)

Computing Model

- Was requested during the DOE review in 2014, put on hold due to the P5 process and formation of xLBNx.
- Need it soon (along with establishing S&C leadership) to continue the effort and integrate S&C elements of the new Collaboration - no mandate yet.
- It seems like a good idea to offer our Requirements document to the new S&C organization (to be formed) for evaluation and to speed up the process. Is the Coll. Meeting a good venue?

Summary

- Work on S&C input for CDR will start now.
- Progress with the CERN test preparation is contingent on the formation of xLBNx and its new leadership, and getting organized quickly. Time is short, and procrastination could result in risks due to suboptimal solutions.
- It will be crucial to have MOU or some sort of firm agreements with participating institutions regarding the software work needed for the prototype.
- Some extra work for us: at present, for CDR and Computing Model we will need to plan for the possibility of using either single or dual phase technology or maybe even both, until there is further guidance from the Collaboration – this, for example, translates into data rate and volume estimates etc.